A Work Project, presented as part of the requirements for the Award of a Masters Degree in Management from the NOVA – School of Business and Economics.

How can Entertainment Influence Children's Food Choices Towards Healthy Eating

Doron Ettner
Student #1435

A Project carried out at the Consumer Behavior course,
under the supervision of:
Prof. LuísaAgante
May 2014

Acknowledgments

Nutri-Ventures (Portugal); The Children's Channel & Logi (Israel); Prof. Luísa Agante (NOVA SBE, Portugal); Gal Ettner-Levkovitz; Adi Nevo; Andrea Brody-Barre and Michal Rosen.

Abstract

The purpose of this study is to explore whether the use of edutainment is able to positively influence children towards healthier eating habits. Using in-depth interview children's food choices were compared pre and post exposure to educational action cartoon. The study focused on children form the age 5 to 10 in Israel, and was trying to assess at what age groups the message conveyed in the video was correctly retained. Parents were interviewed as well to validate the children's answers about their food habits, as well as the children's general media consumption. Results suggest that from age 7 children find the exposure engaging and the message is correctly retained in most cases, especially with the older children. We also noticed that most children were already doing healthy food choices before the exposure to the stimuli.

Keywords: children; food choice; healthy eating; edutainment; TV;

Table of Contents

Introduction

The rise of overweight and obesity is a worldwide phenomenon ([29]OECD, 2013) that affected 40 million children around the world in 2011. About 18% of the children in the US ages 6 to 8 are obese or overweight ([30]Ogden et al., 2012). According to the [57]WHO (2013) the main cause of obesity and overweight lies in the "energy imbalance between calories consumed and calories expanded [sic.]". This imbalance can be explained by unhealthy food choices that are available in the Western world combined with a much more sedentary lifestyle. While obesity can be partially explained by genetics, 70 percent of it is attributed to the lifestyle of children and their parents ([21]Hota et al., 2010). Obesity in childhood and in adolescence increases the likelihood of obesity in adulthood. The results of obesity in adulthood are increased likelihood to suffer from health problems such as heart disease, Type II Diabetes, strokes and more ([8]CDC1, 2013). It is therefore crucial to underline that making persistent unhealthy food choices in childhood may lead to serious health problems in adulthood.

The Director of Public Health Services of Israel pointed out that in Israel, 25 percent of school-age children are overweight according to the *WHO's Child Growth Standards*. It is important to point out, that there is a higher percentage of overweight in the Arab population, the Jewish Orthodox community and the Bedouins. They also have higher numbers of underweight and shorter stature ([40]Robin et al., 2013). Those three sectors of the Israeli population were not considered in the sample.

Israeli society is a diverse population with approximately 20 percent of the population being Arabs and 9-19 percent being Orthodox Religious Jews ([9]CBS[2] , 2011). While the first is exposed mostly to different media channels, the latter is more traditional and less exposed to mainstream media at all.

Although there is disagreement among scholars as to what defines unhealthy foods, we would be following the [56]WHO (2010) definition, which suggest that unhealthy foods are those that are processed or contain high percentage of salt or sugar.

The literature has indicated several strategies to dealing with issues of children's healthcare such as obesity. One of the most innovative approaches is the use of edutainment ([4]Aoki et al., 2004). Edutainment is a way of using high media exposure for the benefit of the child by blending educational content with entertainment

[1] Centers for Disease Control and Prevention

[2] Central Bureau of Statistics Israel

techniques. This approach capitalizes on the abundant data that indicates children's accessibility to various media outlets. Children between the age of 8 and 10 are using media for 5.5 hours a day, which is comparable to 8 hours due to simultaneous use of multiple media. 3.5 hours are spent on watching TV per day. Children between 5 and 9 spend 28 minutes online ([18]Gutnick et al., 2011), mostly in games or on social networks.

What started as a concern already in the 1950's, was later established in various research. TV advertising as well as other forms of media has an effect on shaping children's ([3]Andronikidis and Lambrianidou, 2010) attitudes and behaviors towards unhealthy food ([19]Halford et al. 2004). Most of the investment done by marketers is on the marketing of unhealthy food.

In the US food industry alone, approximately $1.6 billion are spent every year advertising to children under 17 years old. From that, 46 percent is spent on TV advertisements ([51]Teinowitz, 2008). Content analysis made by [37]Powell et al. in 2007 showed that out of 50,000 food advertisements viewed by children, 98 percent represented food with high levels of fat, salt or sugar.

According to [27]Moore (2006) TV is still a more common and accessible resource of information, but we are quickly heading towards the online world. 56WHO (2010) further states *"although television remains an important medium, it is gradually being complemented by an increasingly multifaceted mix of marketing communications that focuses on branding and building relationships with consumers"*.

The main goal of this research is to add to the growing body of edutainment research by analyzing the impact that watching a TV series has on children's attitudes and intended behaviors towards healthy eating habits and reducing sugar in their diet.

Literature Review

Healthy food

> *"A diet high in fruits and vegetables is important for optimal child growth, maintaining a healthy weight, and prevention of chronic diseases such as diabetes, heart disease and some cancers, all of which currently contribute to health care costs in the United States"*([8]CDC 2009).

In a simplified way, *healthy food* is food that is high in nutritional value and is not highly processed, saturated with fat, salt or sugar. Examples can be seen in fruit and vegetables, as well as legumes, whole grains and nuts. On the contrary, *unhealthy food*

is commonly regarded as food that contains high levels of fat, sugar and salt ([56]WHO, 2010). While it is argued that these parameters (salt, fat and sugar) are no longer enough for the educated individual to make thoughtful choices of preferred nourishment ([25]Lobstein and Davies, 2008). Since this study deals with children, such limited definition is necessary. Children are in an early developmental stage and therefore a more sophisticated model will complicate their understanding and be hard to measure.

Therefore, this paper will use the WHO's definition to describe healthy foods, although it admittedly excludes dimensions of health that might be more accessible to adults such differences in different types of fats, whole grains vs. cereals etc.

Media Effects

There are large numbers of studies documenting the effect of media exposure on children and their choices of consumption ([19]Halford et al., 2004; [37]Powell et al., 2007). From all media, TV advertising is the one most studied, since it is also where marketers tend to invest the majority of their budgets. Further, children's lack the cognitive skills to correctly assess the advertised message due to their vulnerability, immaturity and inexperience ([47]Snyder, 2011).

Thus, and regarding advertising (both through traditional media and product placement), it has been shown to influence children's consumption choices by shaping children's future behavior in food selection ([19]Harlford et al., 2004; [27]Moore, 2006). Through commercials, children create positive attitudes towards the advertised product, not only when it is unhealthy but also for healthier choice ([7]Borzekowski and Robinson's, 2001; [14]Dixon et al., 2007).

Children today live in a commercialized world where brands play a very important role and therefore they prefer branded food to their non-branded counterparts ([12]Culp et al., 2010). The preference of branded foods carries on into the healthy food choices. Studies have shown that children have more positive attitudes towards healthy product if it is from a familiar brand ([41]Robinson et al, 2007).

While advertising and content are not essentially the same, similar lessons can be observed. For example, [27]Moore (2006) notes that television shows "model" food choices without explicit advertising. These choices, by and large, reflected unhealthy habits, favoring processed and pre-made meals and snacks. Interestingly, 50Sullivan and Birch (1994) as well as [11]Contento (2008) established that multiple exposures to marketing campaign enhance consumption on the one hand, but builds awareness and

reduces xenophobia on the other ([13]Dias and Agante, 2011). Another interesting finding in the context of media use can be found in [43]Rose et al. 2012. They show that through the use of fantasy, children express positive attitudes towards advertisements and much enthusiasm.

[14]Dixon et al. (2007) found that children exposed to healthy food advertisements were both likely to have more nutritional knowledge and higher favorable attitudes towards nutritious foods.

Edutainment

"*Edutainment is the act of learning heavily through any of various media such as television programs, video games, films, music, multimedia, websites and computer software. Entertainment is the media and education is the content. The development of edutainment environment is also intended to implement technological innovations in education*" ([39]Rapeepisarn et al., 2006).

It is defined by [26]McFarlane et al. (2002:8) as ''*activities structured with a view of loosely supporting education, usually a combination of activities and games with an overtly educational content*'' or simply the convergence of education entertainment ([1]Addis, 2005).

While edutainment is not necessarily related to the digital world, the use of computer games creates an environment in which the content creates a task stimulation, evoke development of knowledge and the playing itself improves skill ([42]Rosas et al., 2003).

Although edutainment does not focus on a specific brand or product, it still aims to bring the fun, immersive approach to learning preferences. Similarly to the way "advergames blur the line between entertainment content and persuasive messages" ([16,17]Friestad and Wright, 1994, 1995), edutainment might be used to promote healthy eating habits employing similarly entertaining and persuasive tactics. The impact of educational games may be difficult to specifically parse (due to multiple goals, preexisting relationships with characters in them, etc.), but they are becoming increasingly prevalent in classrooms as teachers and parents realize their effectiveness ([22]Kinard and Hartman, 2013; [23]Kirriemuir and McFalane, 2004).

An interesting example for the beneficial use of edutainment and healthy eating habits can be seen in the study of [4]Aoki and his colleagues (2004), this study concluded that healthcare education can achieve high benefits with children from well balanced

learning tool combined with attractive entertainment.

Child Development Stage / Child and Media

[33]Piaget and Inhelder (1969) suggest four stages in children's cognitive development that are related with the establishment of consumer knowledge and decision making: until the age of two, the child is learning to recognize his senses, as well as use and develop his natural motoric skills. This stage is called: **Sensorimotor**; The second stage, **Pre-operational**, occurs around the ages two to seven. This period is regarded as a transitional period, in which the child is not yet capable of understanding concrete logic, establishes his language skills, but is still not able to comprehend perspectives apart of his own (egocentrism). This stage is finalized as the child develops the ability to go from simple action to operation. The third stage hence is **Concrete Operational**, at this stage, children start to develop their logical skills and have more organized thought, yet still in a very concrete form; the last the **Formal Operational** stage, from age eleven until adulthood, when abstract messages are becoming understandable, able to deduce information from general ideas and think in a more theoretical way.

The cognitive development of the child affects the way the child sees and understands the advertising content. Some researchers claim that it is from around the age of 7 that the child shows some understanding of the persuasive intent of traditional advertising ([2]An et al., 2014). Other authors conclude that a noticeable increase occurs around the age of 10 ([44,45,46]Rozendaal et al., 2009, 2011a,b; [32]Panic et al., 2013).

[20]Hart and his peers (2002) claim that in primary school cognitive development of children has a major internal effect on health awareness, but as they are in the transitional stage, the ability to understand abstract concepts like vitamins and food transformation stands upon concrete experiences that builds into knowledge ([10]Contento, 1981; [20]Hart et al., 2002).

Pro-nutritional educational campaigns have been used in attempts to change children's food habits before. However, [21]Hota et al. (2010) claim that the initiatives might have failed to increase knowledge because they did not tailor the tone of their message to children.

In the dietary advice of [48]Southgate (1992), motivation and understanding are crucial merits to achieve healthy eating habits. Children see "healthy food" as "adult food", which in their eyes translates into boring, dull and tasteless ([53]Watt and Sheiham, 1997; [20]Hart et al., 2002). [28]O'Doherty and Holm (1999) highlighted the perceived lack

of urgency that children demonstrate towards health issues, which can explain the lack of motivation associated with healthy diet.

Furthermore, young consumers are not only unconcerned with health consequences, but also participate in "*media multitasking,*" or the "*practice of participating in multiple exposures to two or more commercial media forms at a single point in time,*" ([5]Bardhi et al, 2010:316) thereby challenging advertisers' abilities to draw and engage their attention ([5]Bardhi et al, 2010; [52]Wallis, 2006). On the one hand, these consumers became better at decoding media and advertisement messages, but on the other hand, they consume multiple media simultaneously ([5]Bardhi et al., 2010), which eventually increases their exposure to the messages. As long as multitasking behavior continues to increase, the kids of "Gen Y" will likely be exposed to advertising from multiple sources, suggesting that they too will be adept at media decoding in a stimulus-rich environment.

Hypothesis

While many studies have demonstrated the negative effect of media outlets on children's eating habits, very few have sought to study the positive effect that these outlet may have on the children's consumer knowledge and behavior. This study is trying to address this gap.

In a more global perspective, unlike the majority of the studies in the field, focusing on how negative messages are able to penetrate young children's defense systems, this study tries to use the children's vulnerability in their favor.

Hypothesis: Exposure to educational TV show, showing harmfulness of sugar will reduce children's want for such product.

From this hypothesis, the following questions would be addressed:

1. Does the use of positive stimuli (e.g.: educational TV show) increase children's knowledge of healthy food?
2. H: Does the use of positive stimuli (e.g.: educational TV show) increase children's motivation to learn about healthy food?
3. Does the use of positive stimuli (e.g.: educational TV show) increase children's motivation to consume healthy food?

Methodology

Design

Due to the sensitivity of the subject, the studies followed [51]UNICEF (2002) recommended guidelines for research involving children. The study was assessed and received input from a schoolteacher and a child nutrient specialist to ensure appropriateness.

Parental consent granting permission to participate in the study was obtained for all study participants. The children were also informed that they were participating in a study and were offered the choice to not participate or stop their participation at any given moment. Following the recommendations by [35]Podsakoff et al. (2003) for reducing evaluation apprehension, all children were informed that there are no right or wrong answers, and that their responses would remain confidential.

Sample

The population for this study was chosen to be Israeli children at ages 4 to 10 from the Tel-Aviv metropolitan area. The ages were chosen in accordance with the literature abovementioned, as well as the recommended ages of the series used as stimulus (*Nutri-Ventures).* While a more diverse sampling would have been appropriate, in the scope of this work a convenient sample was depicted. It is therefore important to relate to the results accordingly.

The sample included 5 boys and 2 girls, aged 5-10, 4 mothers and 3 fathers. Out of nine children that were scheduled interview, seven participated (see table 1 summarizing the sample). Two children initially agreed to participate, but as the researcher arrived they had changed their minds (one preferred playing on the iPhone and the other was upset that day).

Table 1 – Sample Composition

#	Gender	Age	BMI	BMI Check
1	Boy	5	14.88	Healthy weight
2	Boy	9.75	15.31	Healthy weight
4	Girl	7	13.02	Underweight
5	Boy	7	19.22	Overweight
6	Girl	10	16.57	Healthy weight
7	Boy	10	16.56	Healthy weight
8	Boy	7.5	16.07	Healthy weight

Table 1 (#3 and #9 were disregarded)

The children's BMI was calculated according to Body mass index-for-age percentiles boys/girls 2 to 20 of CDC. Most children in our sample were found in healthy weight. The exceptions were one girl 7^{yrs} (#4), which was slightly underweight and one boy 7^{yrs} (#5), which was overweight (almost obese). Interestingly, the girl that

was found underweight, was the only one in our sample to make 2/3 of her food choices from the less healthy in both pre and post exposure. Consult appendix 4 for BMI percentile table of CDC.

Stimulus

The primary stimulus chosen for this study is an episode of *Nutri-Ventures*. *Nutri-Ventures* is a Portuguese production firm whose goal is to create high quality entertainment to educate and promote children's healthy eating choices and habits all over the world.

Their dual approach combines a children's cartoon with an interactive webpage, both of which focus on a fun and adventurous approach to health education and brand recognition, making *Nutri-Ventures* ideal for this study. Additionally, their high quality and international penetration (the series is dubbed in many languages and broadcast in over 23 countries) makes them especially useful for a study in Israel, that can later be compared with an international study.

Further, *Nutri-ventures* was recognized by the First Lady of the United States, Michelle Obama, who invited them to the White House to participate in a conference with specialists from the field of nutritional marketing for children. The meeting (The White House Convening on Food Market to Children) was arranged as part of the "***Let's Move Organization***[3]". Approximately 20 firms spanning the retail, media, and entertainment sectors participated in the meeting (e.g.: Disney, Burger King and Coca Cola) ([34]Pimenta, 2013).

Full episode (~22 min) of the series "*Nutri-Ventures*" (cartoon video quest, revealing the dangers of sugar and the importance of fruits) was used for the study. The episode presented a story where the characters took a potion of fruits in order not to be hypnotized by the sugar. So the main message was that sweets and all sugar foods seem delicious because people are hypnotized by the sugar, but if we eat fruit it gives us the power to see that sugar is bad for our health (in the series al sweets looked disgusting when characters took the potion). The series is dubbed from Portuguese to Hebrew, and the original copy with a written consent from the broadcasting representative in Israel was given to the researcher.

[3]Let's Move Organization is an organization initiated by Michelle Obama *"dedicated to solving the problem of obesity within a generation, so that children born today will grow up healthier and able to pursue their dreams"* ([24]Let's Move, 2012)

Pre-test

Before developing the guideline for this study, a few informal interviews and consultation have been made. First, a consultation with a child nutritionist, educated the researcher and familiarized him with the jargon of child nutrition in general and in Israel specifically. The nutritionist also assisted in choosing the foods that are more commonly recognized by Israeli children, as both *healthy* and "*less healthy choices*". She expressed her opposition to the use of the term "*unhealthy*" versus the term "*less healthy*" as she finds it important to portray that with the "*right balance*" most foods are considered ok.

Another challenge that had been raised by the professional child nutritionist was that while the series is dubbed to Hebrew, it is not necessarily adapted to the educational approach recommended by the Israeli Ministry of Health that is followed by the educational institutes in Israel. While *Nutri-Ventures* is using the wheel of nutrient, the Ministry of Health in Israel is using an adapted form for the old *Food Pyramid* that was developed by the US Ministry of Agriculture - the *Israeli Food Pyramid* (see appendix #3).

While this Pyramid might be under controversy, as it puts (for example) fat coming from butter under the same category to the one coming from Avocado, having different methodologies might be confusing for a child.

Furthermore, the questionnaire and the research material were discussed with a schoolteacher, which is also a mother of three (two of which are within the study's sample ages: 4 and 10). The teacher's feedback assisted in forming the questions and the tools planned to be used in the interviews. She stressed the importance of making the interview engaging, as kids at these ages lose interest easily.

After adapting the material according to the different professionals' recommendations, a pre-test interview was conducted with a four-year-old girl. The two main goals set for this pre-test interview were: 1) practice for the researcher for the interaction with children; 2) check the different materials and her ability to recognize the used symbols and pictures.

Following this interaction, some of the food pictures were changed, in order to make them more recognizable and simplified pictures.

Procedure

Interview with the Child

All children answered semi-structured in-depth interviews, which were administered by the researcher, question by question, by projecting them and explaining what they had to do on each question. In order to guarantee that all children had the same treatment, the same procedure was used with all ages. Each interview (including the watching time) took approximately 40-50 min. The length was mainly dependent on the willingness of the child to elaborate and co-operate without loosing interest.

A convenient sample was chosen, mainly due to bureaucratic complications of the Israeli education system (in order to address the children through the public school system in Israel, it can take a few months). Further, the ideal environment for such interview was in the respondent's home, as it increases the openness and gives a physical context ([36]Polsa, 2007) and to achieve this, familiarity eases the way to the respondent's home.

The interviews, as well as the stimuli were created and administered in the children's native language (Hebrew) and were later translated by the researcher.

The researcher asked family and friends that know parents of children from the ages of 4 to 10 to participate in the study.

Except of one case, where the interview was conducted at the grandparent's house, all interviews were conducted in the respondent's homes (mostly in the child's bedroom).

All parents were informed of the research purpose and tools that were planned to be used with the children, and they approved to record (and in 3 cases videotape the interview). They were instructed to invite the children to participate, and were asked not to elaborate about the research itself or the use of the series and just tell their children that it is a study about food. This was done in order to avoid any unwanted bias.

The children were introduced to the researcher and had a few minutes of informal interaction with the parents around, after which the researcher prepared the materials and set privately with the child, so he would be able to speak freely and not be concerned with being supervised by the parent.

The researcher introduced to the child the topic of the study as being "about food" and asked his willingness to help in his work for school. It was stressed to him that there were no right and wrong answers, and that he could stop the interview at any point. He

was told that anything said in the room would remain in secrecy, unless he chooses to share the information himself. He was asked for his informed consent for recording the interview (and in 3 cases also videotape).

The interview was split into three parts: 1. Introductory questions and food choice prior to any intervention; 2. An episode of *Nutri-Ventures* which was interrupted after 19 min to confirm the child's interest in the episode; 3. Questions confirming the child's interest and understanding of the episode and his food choice following the stimuli.

The English version of the full interview guide used with the child can be consulted in Appendix #5.

Parents Interview

After interviewing the child, supplementary interview was conducted with the child's parent. The main goal of that interview was to confirm the child's answers, and make sure that the child conveyed a realistic description of his breakfast habits.

Further, the parents were asked general questions about the child consumption of Internet and Television, as well as consumption and preferences of fruits and vegetables.

In order to calculate the child's BMI, the parent was asked for the child's height and weight. If he/she did not know, the child was asked to be measured.

Finally biographical data such as parent's education and profession was collected to evaluate the social status of the family. All parents were married except one single mom (a widow). Consult chart #5 for educational information of parents.

The English version of the full interview guide used with the parents can be consulted in Appendix #6.

Measures

In order to measure Food Choice, we used two pictorial cue cards, since they were found to be practical for use when doing a research with children as they allow them to understand, organize and express their choices in a way that they can even enjoy ([6]Birch, 1980; [49]Sullivan and Birch, 1990; [15]Domel et al., 1993; [13]Dias and Agante, 2011). The cards were created similarly to the ones used at [13]Dias and Agante (2011), and the choice of the specific food contains three healthier choices and three less healthy choices. The food was also chosen in accordance to food featured in the Sugar and Orange Kingdom. The final list of food was comprised of: Tuna, Egg, Apple, Orange, Sandwich with avocado and Sandwich with spreadable cheese as the healthier choices; and ice-cream, chocolate bar, high in sweets type of cereal, chocolate cake, cookies and

Bamba[4] (see appendix #1). The list was validated with an Israeli child nutritionist to guarantee that it represented appropriate choices for the target and for the snack situation and it was perfectly understood by the children participating in the pre-test (assuming that if a child from the lower age edge of the sample can recognize, the older ones would not have a problem). We used two cards since we measured the food choice prior to the stimuli and after being exposed to the stimuli. They were asked: "*Imagine that your parents had to go to work, and they asked me to watch out for you. But I don't know what you like eating… I'm giving you these 6 options to choose from, and asking you to choose 3 that you prefer having*".

In order to confirm if the child understood which ones were the healthy/unhealthy options, and also to see if he/she had identified correctly the personality of the characters in the series, we asked the child which food items he would choose for a snack to two characters of the series (one good and one bad). Before choosing the foods the child was asked which characters he recognized (from the card in appendix #2) and, from those, which were the good and the bad characters. Through his response we could further reach a conclusion about his understanding of the episode's content and healthy eating.

Results

The analysis of the interviews suggests that the older children in the study, two 10 years old boys and a 10 year old girl, were able to retain the main issues of the episode, identify the message and express it in their drawing correctly. As of the younger children, two 7 years old boys and one girl, all of them seemed to identify the main issues correctly, but the girl seemed to be confused in her understanding of what is reality and what is fiction. She was the only one with prior exposure to the series, and it is therefore hard to compare her results. The last 7 years old boy (#8) did not seem to pay too much interest in the exposure. The youngest child, 5 years old seemed to be more intrigued by the action rather then the main message.

Most children interviewed either had no breakfast at all before going to school or had a breakfast that consisted of sweet and sugary food choices. The only children who had a healthy and not sweetened breakfast were child #4, who, interestingly, was the only child in the study who was underweight as well as regular consumer of the series, and

[4] Very known Israeli salty snack.

child #1 (boy 5^{yrs}) who claimed he had mozzarella sticks. All the children in the study used to take a healthier food choice to school (sandwich with protein, vegetables, fruit, etc.) when compared to what they had at home.

Breakfast was typically composed of either a type of sweet cereal with milk, a cookie, chocolate milk (drink) or from the "MAADANIM" category (=prepared pudding / sweet yogurt). One child (#7 - boy 10^{yrs}) said he had the regular Corn Flakes, with Honey, instead of having the sweet version, which he would have preferred.

For the school break, as called in Israel *the 10's break* (commonly around 10 am), children expressed healthier food choices. One child **(#5 boy 7^{yrs})** said he had "*Tomato, Cucumber, egg sandwich, red pepper - not spicy! and an apple or sometimes a pear"*; his father also confirmed (and added) that he has a sandwich with cheese or hummus spread always with a vegetable in it.

Food Choice Pre/Post Intervention

In the *pre exposure* our sample was divided, with 3 children choosing the healthiest options (3/3 healthy), 3 children choosing mostly healthy options (2/3 healthy) and one choosing 2 unhealthy (1/3 healthy). The child that chose the unhealthy options (Girl #4 - 7^{yrs}) made two less healthy choices in both pre and post exposure settings.

When we asked children to make a food choice to the good/bad character, the results were also diverse. Some children made the distinction of healthy food for the good guys while less healthy for the bad. As an example, a boy (#8), 7.5^{yrs} explained is choices as follows: "*Theo - Apple, avocado sandwich and tuna; he is good and you can see on him that he is thin and likes to eat good food*" vs. "*Bamba, Cake and Cookies - as he is one of the bad guys and he likes to be fat* ".

Other children on the other hand said that they would have given healthy food also to the bad guys: A boy, 10^{yrs} (#7), that chose: apple, tuna and bread with avocado both to Ben (good) and to the Boss (bad) explain it by saying: "*to the boss I would give the same, as he should eat healthy and not sweet. Sweet, I think, you can eat only 2 sweets a day - that's it. And if it is large sweet for example that is it.*" (#7)

However in both cases we can see clearly that all children understood which options were more or less healthy and that all children understood the personality of the series characters. The differences were only on how they would react to that knowledge.

Observation

During the screening, all children seemed to enjoy watching the episode. To avoid their

wish to satisfy the researcher with their answer, the episode was halted after 19 minutes, and the child was told: "*I'm done here, but it is almost over… do you want me to wait for you?*" Only two children decided to stop, child #4 (girl 7^{yrs}) since she watched it normally at home and knew the episode; and (#8 boy 7.5^{yrs}). The rest wanted to continue watching after intervention until the end of the episode.

Observing the children while watching the series, the researcher noticed high level of concentration. One child (**#5 boy 7^{yrs}**) mumbled "*Ouch!*" as one of the character threw and shuttered a vassal over the door or "*they cannot get in*" when the magic door was closed.

A child (#8 boy 7.5^{yrs}) seemed to enjoy during the watching on the one hand, danced to the rhythm in times where the music became more dramatic and when was asked if he had enjoyed the episode he jump with enthusiasm saying "*yes!*". On the other hand, when he was offered if he would like to continue watching (19 min intervention) he said: "*No need. Lets finish helping you with your homework*". He also refused to the offer to have more episodes for later saying there is no need for that. Further, he gave the least effort on the drawing, claiming, "*I have a short memory*" so he just wrote on the paper "*Fu and* fichss *(פו ופיכס)*" (=sounds of disgusted) and four simple drawings of people… He described correctly the relation between the characters, but could not recall any of their names.

Discussion and Limitation

This research was aimed at being a first step of determining the effectiveness of edutainment in order to: 1. Expose children to healthy eating habits; 2. Educate children on nutritional aspects of food and 3. Motivate children to make healthier (and more educated) choices of food.

The tested population of this research was Israeli children from ages four to ten. According to the latest comparison conducted by the Israel Ministry of Health on 2013, there is a worrying growth of child obesity relatively to other OECD countries.

While conducting interviews, it was surprising to find how children at a very young age were capable of making healthy choices prior to any intervention or manipulation. The choices the children made reflected a much higher knowledge and understanding of healthy foods than expected at the beginning of the study.

An explanation for this knowledge was suggested in one of the interviews, where the child explained his food choices in the following manner: "*I once had a class about*

healthy eating, and they told us that chocolate is not that healthy and they did not relate it to the nutrient pyramid and also snacks. [...at that class] *we learned that our body is made mostly of proteins*".

It is suggested that the "class" that the interviewee spoke about is part of the national program *Tafur Alay* תפור עליי (="tailored to me") promoting healthy lifestyle of children as early as Kindergarten age, or more specifically, *Chayuta Briuta* חיותה בריאותה (=word game for healthy life) educating about healthier nutrient choices. This program, lead by the Ministry of Education is a nation wide program that provides educational aid for schools as well as parents.

The edutainment study established that at least in terms of theoretical knowledge, Israeli children are able to make healthy choices and understand the differences between healthy and less healthy foods.

In terms of the tools used in the study (Nutri-Ventures Episode), the Israeli children were engaged with the show, enjoyed it and, in most cases, were able to understand and reiterate its messages. The episodes were seen as both "fun" and "cool".

However, due to the interfering variable of the children's prior exposure to nutrition education, the tools offered were not able to indicate whether they are capable of changing choices made post exposure, nor proving or disproving their effectiveness. The children already had the needed theoretical knowledge and therefore we were not able to asses the tool's effectiveness in educating them.

It is further hard to evaluate the Nutri-Ventures Episode's ability to transfer from enhancing knowledge to behavioral change. It is therefore suggested that future research will develop a methodology that can better understand the movement from retention of knowledge to behavioral change. Such research will have to be a longer-term research that revisits the subjects after multiple exposures.

It is future suggested that it is crucial to develop a tool to examine quantified measurements that can be more representative and comparable. Such tool can be applied to a more diverse sample of children for example, children from other countries, or from different social economic status.

References

[1] Addis, M. (2005). New technologies and cultural consumption – edutainment is born!, *European Journal of Marketing*, 39(7/8), 729 - 736

[2] An, S., H. Jin and E. Park (2014). Children's Advertising Literacy for Advergames: Perception of the Game as Advertising. *Journal Of Advertising*, *43*(1), 63-72. doi:10.1080/00913367.2013.795123

[3] Andronikidis, A. I. and M. Lambrianidou (2010). Children's understanding of television advertising: A grounded theory approach. *Psychology & Marketing*, *27*(4), 299-322.

[4] Aoki, N., S. Ohta, H. Masuda, T. Naito, T. Sawai, K. Nishida, ... and T. Fukui (2004). Edutainment tools for initial education of type-1 diabetes mellitus: initial diabetes education with fun. *Medinfo*, *11*(Pt 2), 855-859.

[5] Bardhi, F., Rohm, A. J., & Sultan, F. (2010). Tuning in and tuning out: media multitasking among young consumers. *Journal of Consumer Behaviour*, *9*(4), 316-332.

[6] Birch L. L. (1980). Effects of Peer Models' Food Choices and Eating Behaviors on Preschoolers' Food Preferences. *Child Development* 51 (2): 489 – 496.

[7] Borzekowski, D. L. and T. N. Robinson (2001). The 30-second effect: an experiment revealing the impact of television commercials on food preferences of preschoolers. *Journal of the American Dietetic Association*, *101*(1), 42-46.

[8] Centers for Disease Control and Prevention (CDC). (2013). *Childhood Obesity Facts.* Retrieved on April, 2014 from: http://www.cdc.gov/healthyyouth/obesity/facts.htm

[9] Central Bureau of Statistics (2011). *Social Survey Publication 13* (2011). http://www.cbs.gov.il/publications13/seker_hevrati11/pdf/intro_h.pdf

[10] Contento, I. (1981). Children's thinking about food and eating—a Piagetian-based study. *Journal of nutrition education*, *13*(1), S86-S90.

[11] Contento I. 2008. Nutrition education: linking research, theory, and practice. Asia Pacific Journal of Clinical Nutrition 17(1): 176 –179.

[12] Culp, J., R. A. Bell and D. Cassady (2010). Characteristics of food industry web sites and "advergames" targeting children. *Journal of Nutrition Education and Behavior*, *42*(3), 197-201.

[13] Dias, M., and L. Agante (2011). Can advergames boost children's healthier eating habits? A comparison between healthy and non-healthy food. *Journal of Consumer Behaviour*, *10*(3), 152-160.

[14] Dixon, H. G., M. L. Scully, M. A. Wakefield, V. M. White and D. A. Crawford (2007). The effects of television advertisements for junk food versus nutritious food on children's food attitudes and preferences. *Social science & medicine*, *65*(7), 1311-1323.

[15] Domel S. B., T. Baranowski, H. Davis, S. B. Leonard, P. Riley and J. Baranowski. (1993). Measuring Fruit and Vegetable Preferences Among 4th- and 5th-Grade Students. *Preventive Medicine* 22 (6): 866 – 879

[16] Friestad, M. and P. Wright (1994). "The Persuasion Knowledge Model: How People Cope with Persuasion Attempts". *Journal of Consumer Research*, 21(1), 1-30.

[17] Friestad, M. and P. Wright (1995), "Persuasion knowledge: lay people's and researchers' beliefs

about the psychology of advertising", *Journal of Consumer Research*, 22(1), 62-74.

[18] Gutnick, A. L., M. Robb, L. Takeuchi, and J. Kotler (2010). Always connected: The new digital media habits of young children. *New York: The Joan Ganz Cooney Center at Sesame Workshop.* http://www.joanganzcooneycenter.org/wp-content/uploads/2011/03/jgcc_alwaysconnected.pdf

[19] Halford, J. C., J. Gillespie, V. Brown, E. E. Pontin and T. M. Dovey (2004). Effect of television advertisements for foods on food consumption in children. *Appetite*, *42*(2), 221-225.

[20] Hart, K. H., J. A. Bishop and H. Truby (2002). An investigation into school children's knowledge and awareness of food and nutrition. *Journal of Human Nutrition and Dietetics*, *15*(2), 129-140.

[21] Hota, M., R. Cáceres and A. Cousin (2010). Can Public-Service Advertising Change Children's Nutrition Habits?. *Journal of Advertising Research*, *50*(4), 460-477.

[22] Kinard, B. R. and K. B. Hartman (2013). Are You Entertained? The Impact of Brand Integration and Brand Experience in Television-Related Advergames. *Journal of Advertising*, *42*(2-3), 196-203.

[23] Kirriemuir, J. and A. McFarlane, (2004). Literature review in games and learning. http://telearn.archives-ouvertes.fr/docs/00/19/04/53/PDF/kirriemuir-j-2004-r8.pdf

[24] Let's Move (2014), *About Let's Move Organization: America's Move to Raise A Healthier Generation of Kids.* Retrieved on Feb, 2014 from: http://www.letsmove.gov/about

[25] Lobstein, T. and S. Davies (2008). Defining and labelling 'healthy' and 'unhealthy' food. *Public health nutrition*, *12*(03), 331-340.

[26] McFarlane, A., A. Sparrowhawk and Y. Heald (2002). *Report on the educational use of games*. Teachers evaluating educational multimedia. http://www.kennisnet.nl/uploads/tx_kncontentelements/games_in_education_full1.pdf

[27] Moore, E. S. (2006). *It's child's play: Advergaming and the online marketing of food to children*. Henry J. Kaiser Family Foundation.

[28] O'Doherty, J. K., and L. Holm (1999). Preferences, quantities and concerns: socio-cultural perspectives on the gendered consumption of foods. *European journal of clinical nutrition*, *53*(5), 351-359.

[29] OECD (2013), *OECD Factbook 2013: Economic, Environmental and Social Statistics*, OECD Publishing. doi: 10.1787/factbook-2013-en

[30] Ogden, C. L., M. D. Carroll, B. K. Kit and K. M. Flegal (2012). Prevalence of obesity and trends in body mass index among US children and adolescents, 1999-2010. *JAMA: the journal of the American Medical Association*, *307*(5), 483-490.

[31] Paek, H. J., E. T. Quilliam, S. Kim, L. J. Weatherspoon, N. J. Rifon and M. Lee (2014). Characteristics of food advergames that reach children and the nutrient quality of the foods they advertise. *Internet Research*, *24*(1), 63-81.

[32] Panic, K., V. Cauberghe and P. De Pelsmacker (2013). Comparing TV Ads and Advergames Targeting Children: The Impact of Persuasion Knowledge on Behavioral Responses. *Journal of Advertising*, *42*(2-3), 264-273.

[33] Piaget, J., and B. Inhelder (1969). *The psychology of the child*. Basic Books.

[34] Pimenta, R. (2013) *life&stylebem-estar* Retrieved on Feb, 2014 from:

http://lifestyle.publico.pt/noticias/325455_portugueses-na-casa-de-michelle-obama

[35] Podsakoff, P. M., S.B. MacKenzie, J. Y. Lee and N. P. Podsakoff (2003). Common method biases in behavioral research: a critical review of the literature and recommended remedies. *Journal of applied psychology*, *88*(5), 879.

[36] Polsa, P. (2007). "Comparability in Cross-Cultural Qualitative Marketing Research: Equivalence in Personal Interviews" *Academy of Marketing Science Review*, 11(8): 1-18

[37] Powell, L. M., G. Szcypka and F. J. Chaloupka (2007). Exposure to food advertising on television among US children. *Archives of Pediatric & Adolescent Medicine*, 161(6), 553-560.

[38] Quilliam, E.T., M. Lee, R. T. Cole and M. Kim (2011), "The impetus for (and limited power of) business self-regulation: the example of advergames", *Journal of Consumer Affairs, 45* (2), 224-247.

[39] Rapeepisarn, K., K. W. Wong, C. C. Fung and A. Depickere (2006). Similarities and differences between learn through play and edutainment. In *Proceedings of the 3rd Australasian conference on Interactive entertainment,* 28-32. Murdoch University.

[40] Robin, L., M. Honovich, Z. Stahl, S. Yaari and I. Grotto (2013). Report on Growth of School Age in Israel, 2010-2012. *Director of Public Health Service*. Retrieved on Mar, 2014 from: http://www.health.gov.il/PublicationsFiles/Gdila-school-2010-2012.pdf

[41] Robinson, T. N., D. L. G. Borzekowski, D. M. Matheson and H. C. Kraemer (2007). Effects of fast food branding on young children's taste preferences. *Archives of Pediatrics and Adolescent Medicine*, 161, 792–797.

[42] Rosas, R., M. Nussbaum, P. Cumsille, V. Marianov, M. Correa, P. Flores, ... and M. Salinas (2003). Beyond Nintendo: design and assessment of educational video games for first and second grade students. *Computers & Education*, *40*(1), 71-94.

[43] Rose, G. M., A. Merchant and A. Bakir (2012). Fantasy in Food Advertising Targeted at Children. *Journal of Advertising*, *41*(3), 75-90.

[44] Rozendaal, E., B. Moniek and P. Valkenburg (2009). Do Children's Cognitive Advertising Defenses Reduces their Desire for Advertised Products?. *Communications*, 34(3), 287-303.

[45] Rozendaal, E., B. Moniek and P. Valkenburg (2011). Children's understanding of advertiser's persuasive tactics. *International Journal of Advertising*, 30 (2), 329–50.

[46] Rozendaal, E., L. A. Matthew, E. A. van Reijmersdal, and M. Buijzen (2011). Reconsidering Advertising Literacy as a Defense against Advertising Effects. *Media Psychology*, 14, 333–54.

[47] Snyder, W. (2011). Making the Case For Enhanced Advertising Ethics How a New Way of Thinking About Advertising Ethics May Build Consumer Trust. *Journal of Advertising Research*, 51(3), 477-483. http://links.emeraldinsight.com/ref/40AT425

[48] Southgate, D. A. (1992). Dietary advice: foods or nutrients. *Proc Nutr Soc*, *51*(1), 47œ-53.

[49] Sullivan S. A. and Birch L. L. (1990). Pass the Sugar, Pass the Salt: Experience Dictates Preference. *Developmental Psychology* 26 (4): 546 – 551.

[50] Sullivan S. A., L. L. Birch. 1994. Infant dietary experience and acceptance of solid foods. Pediatrics 93(2): 271–277.

[51] Teinowitz, I. (29 July 2008). FTC study: Dollars spent on marketing to kids much lower than thought. *Advertising Age*. Retrieved from http://adage.com/article/news/ftc-studydollars-spent-marketing-kids-lower-thought/129974/

[51] UNICEF (2002). Children Participating in Research, Monitoring and Evaluation (M&E) – Ethics and your Responsibilities as a Manager. *Evaluation Technical Notes 1:1-11. New York: UNICEF*

[52] Wallis, C. (2006). The multitasking generation. *Time Magazine*, *167*(13), 48-55.

[53] Watt, R. G. and A. Sheiham (1997). Towards an understanding of young people's conceptualisation of food and eating. Health Education Journal, *56*(4), 340-349.

[54] William H. D., director of CDC's Division of Nutrition, Physical Activity, and Obesity. *Centers for Disease Control and Prevention*. 2009: http://www.cdc.gov/media/pressrel/2009/r090929.htm

[55] World Health Organization (2013). *World health statistics 2013. World Health Organization.* http://apps.who.int/iris/bitstream/10665/81965/1/9789241564588_eng.pdf

[56] World Health Organization. (2010). Set of recommendations on the marketing of foods and non-alcoholic beverages to children. http://www.who.int/dietphysicalactivity/marketing-food-to-children/en/

[57] World Health Organization. (2013). *Obesity and overweight 2013* Available at: http://www.who.int/mediacentre/factsheets/fs311/en. *Accessed: February*, 10.

Appendices

Appendix #1 – Food Choices Cards

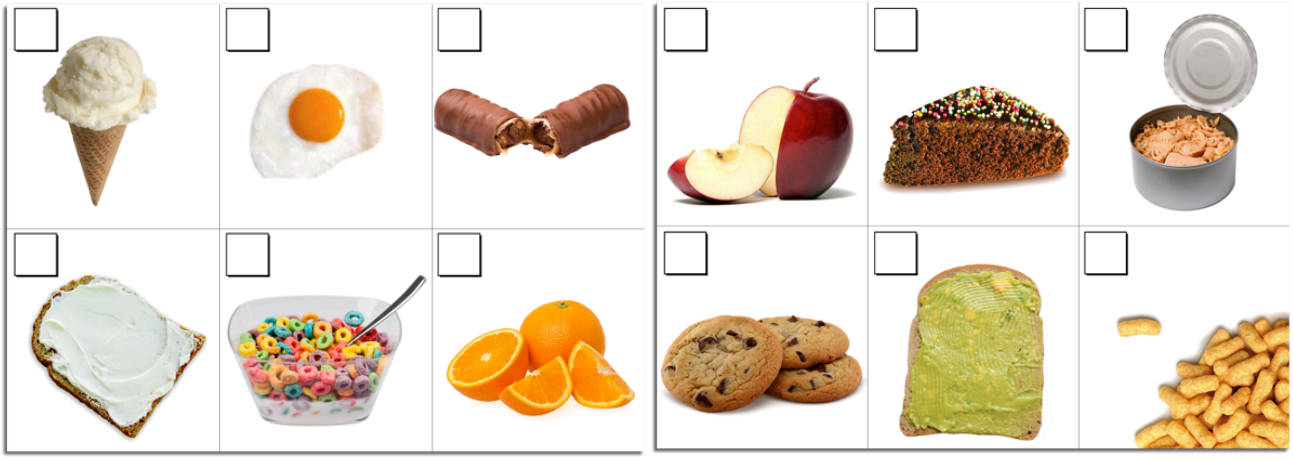
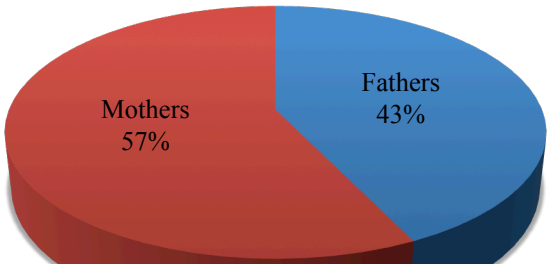


Chart #1 – Distribution of Interviewed Parents **Chart #2 –** Distribution of Children's Gender



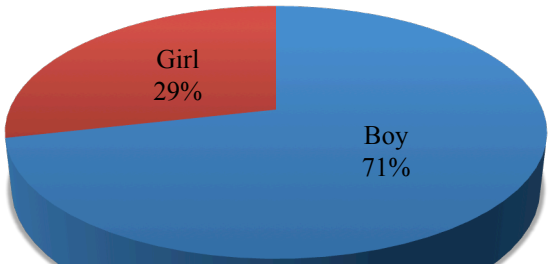


Chart #3 – Distribution of Health according to BMI

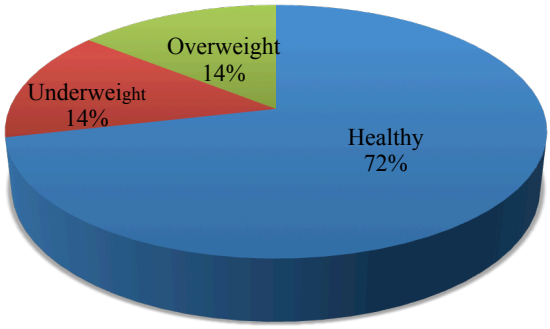


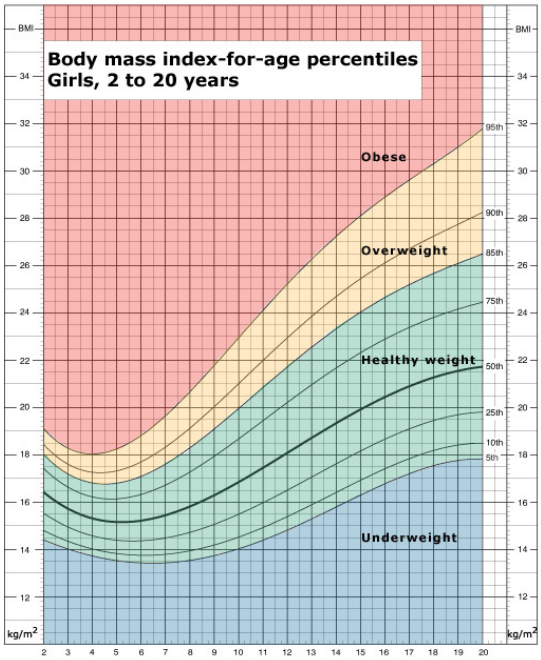
Chart #4 – Food Choice

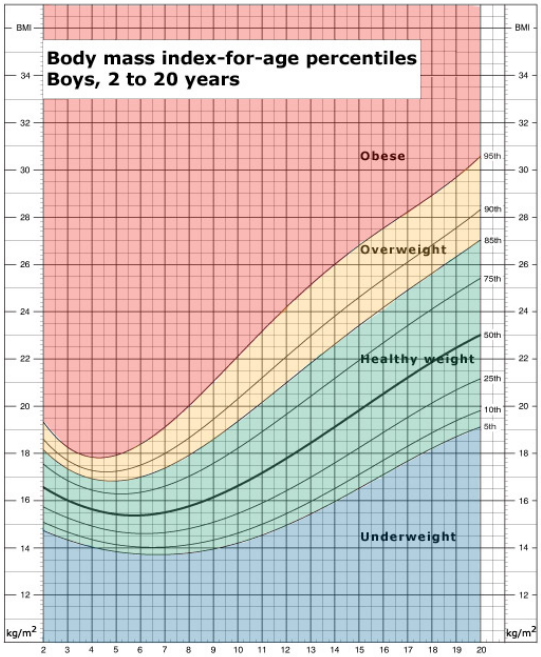
	Food Choice Before TV Exposure	Food Choice Post TV Exposure
Mean	2.29	2.67
SD	0.76	0.52

Appendix #2 – Characters Cards

Appendix #3 – Israeli Food Pyramid

Appendix #4 – BMI for Age Percentiles

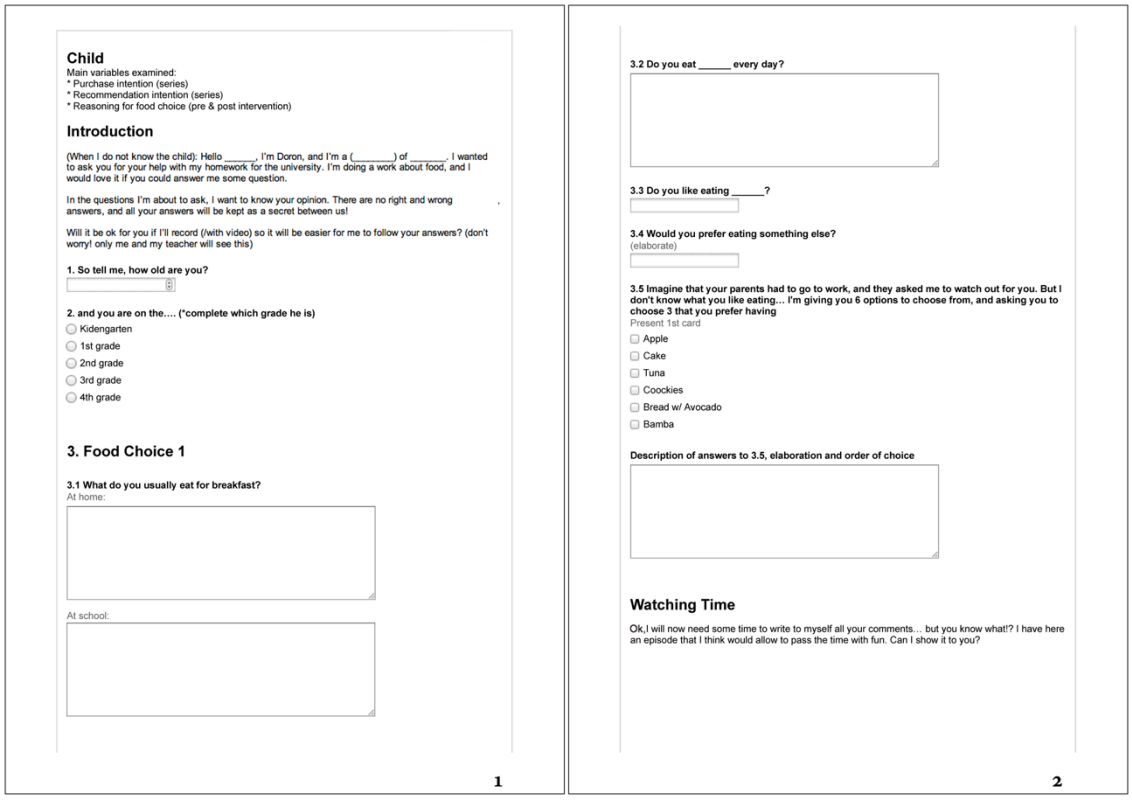




Chart#5 – Parents Education

	Father	Mother
>12 Years	1	0
12 Years	0	1
BA	2	2
MA	2	4
PhD	2	0

Appendix #5 – Children Questionnaire



Child

Main variables examined:
* Purchase intention (series)
* Recommendation intention (series)
* Reasoning for food choice (pre & post intervention)

Introduction

(When I do not know the child): Hello _____, I'm Doron, and I'm a (_____) of _____. I wanted to ask you for your help with my homework for the university. I'm doing a work about food, and I would love it if you could answer me some question.

In the questions I'm about to ask, I want to know your opinion. There are no right and wrong answers, and all your answers will be kept as a secret between us!

Will it be ok for you if I'll record (/with video) so it will be easier for me to follow your answers? (don't worry! only me and my teacher will see this)

1. So tell me, how old are you?

2. and you are on the.... (*complete which grade he is)

- Kidengarten
- 1st grade
- 2nd grade
- 3rd grade
- 4th grade

3. Food Choice 1

3.1 What do you usually eat for breakfast?
At home:

At school:

1

3.2 Do you eat _____ every day?

3.3 Do you like eating _____?

3.4 Would you prefer eating something else?
(elaborate)

3.5 Imagine that your parents had to go to work, and they asked me to watch out for you. But I don't know what you like eating... I'm giving you 6 options to choose from, and asking you to choose 3 that you prefer having
Present 1st card

- Apple
- Cake
- Tuna
- Coockies
- Bread w/ Avocado
- Bamba

Description of answers to 3.5, elaboration and order of choice

Watching Time

Ok,I will now need some time to write to myself all your comments... but you know what!? I have here an episode that I think would allow to pass the time with fun. Can I show it to you?

2

time/description time/description time/description time/description

further away from screen

got closer

said

asked

stared

show enthusiasm

If the child (highly) looses interest or request to stop, offer to play the online game (and try than to get back to the episode)

4.2 Have you ever seen nutri-ventures before?

- Yes
- No

4.2.1 Really? When? Where? Did you like it?

4.3 Have you enjoyed watching this episode?

4.4 Do you like drawing? I want you now to draw me a drawing of what you remember of what you just watched

Show some enthusiasm for his drawing; Could you please explain to me your drawing? (what is this… and this… etc.)

3

4.5 Do you recognize them? do you remember their names by any chance?

Who I showed	Who did the child reconized?	Who could he recall the correct name
Ben	Ben	Ben
Lena	Lena	Lena
Theo	Theo	Theo
Sid	Sid	Sid
Nina	Nina	Nina
Granpa	Granpa	Granpa
Alex	Alex	Alex
G-Force	G-Force	G-Force
Nose	Nose	Nose

Coments

4.6 Can you group them into 2 groups (good guys and bad guys)?

Good

Show first card (Good)

- Apple
- Cookies
- Cake
- Bread w/ Avocado
- Tuna
- Bamba

Bad

Show first card (Bad)

- Apple
- Cookies
- Cake
- Bread w/ Avocado
- Tuna
- Bamba

4

(I'm choosing from the ones the child know 1good/1bad) If you had to prepare a meal for him… what would you give him? why?

(ask for elaboration if he doesn't by himself)

4.8 Would you be interested in watching more episodes?

- Yes
- No
- Other:

4.9 Do you think it would be cool to talk about this series in your school?

- Yes
- No

Food Choice 2

Post-watching the episode

5.1 Your parents asked me once to babysit on you… and I'm giving you once again to choose 3 foods out of these 6

Show 2nd card

- Ice-cream
- Bread w/ Cheese Spread
- Egg
- Morning snack (type of Fruit-loops)
- Chocolate Bar
- Orange

Elaboration on 5.1, explanation and order of choice:

Thank you so much for your help!

Do you want me to give your parents some more episodes for you to watch??

- Yes
- No

5

Hr : Min AM

Month Day 2014

Boy or a Girl

- Boy
- Girl

Powered by Google Forms

6

Appendix #6 – Parents Questionnaire

Parents

#

Who is the interviewee?
- mother
- father
- Other:

Emphasise that all questions relate to a specific child, and not his brothers/sisters! (in all questions the child's name is used to avoid any problems of relating to one of the other children in the family)

Confirm the choices of food intake indicated by the child (make sure the child's answers make sense)

1.1. Can you tell me what _____(name) usually eats for breakfast?
1.1.1 At home

1.1.2 At school

1.2. Does he/she eats _____ everyday?

1.3. Does he/she like eating _____?

1.4 Who choses his/her breakfast?

1

2. Nutritional Habits

2.1 On average, what is _____'s daily consumption of
2.1.1 Fruits

0 1 2 3 4 5
Not at all

2.1.2 Vegetables

0 1 2 3 4 5
Not at all

2.2 In general, how do you think they feel about
2.2.1 Fruits

1 2 3 4 5
Hate Love

2.2.2 Vegetables

1 2 3 4 5
Hate Love

2.3 On average, what is the weekly consumption of _____ of fast food (fast food restaurants) per week?

0 1 2 3 4 5
Not at all 5 or more

2.4 On average, what is the weekly consumption of _____ of prepared food (from frozen/industrial type) per week?

0 1 2 3 4 5
Not at all 5 or more

2.5 On average, what is the weekly consumption of _____ of home cooked food per week?

0 1 2 3 4 5
Not at all 5 or more

2

3. TV Consumption

3. How many hours, _____, watches TV on average
3.1.1 school day
- Not at all
- Less than an hour
- 1-2h
- 2-3h
- 3-4h
- more than 4h

3.1.2 Non school day
- Not at all
- Less than an hour
- 1-2h
- 2-3h
- 3-4h
- more than 4h

4. Internet Consumption

4. How many hours, _____, surfs the net on a
4.1.1 school day
- Not at all
- Less than an hour
- 1-2h
- 2-3h
- 3-4h
- more than 4h

4.1.2 non school day
- Not at all
- Less than an hour
- 1-2h
- 2-3h
- 3-4h
- more than 4h

5. Height and Weight

What is _____ height? (if doesn't know, request to check)
Height (cm):

Weight (kg):

3

Parents' education

Years of education / field
6.1 Mother

6.2 Father

Profession
6.3 Mother

6.4 Father

Wrap-up

If the child showed interest, request to leave episodes that he could watch as well.
Can I leave some episodes for _____ to watch?
- Yes
- No

If he does not request himself to watch, please offer him within the next few days.
Please also indicate if he watched how many times and which episodes

Thank you very much for your participation and co-operation!

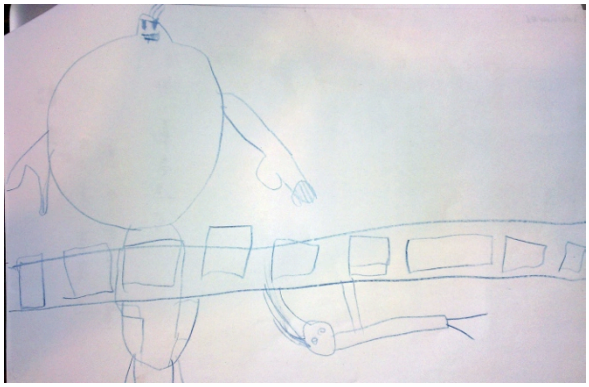
Place for comments...

Powered by Google Forms

4

Appendix #7 – Full Interpretation of Interviews and Drawings

Child #1, boy, 5^{yrs} (kindergarten). The drawing portrayed an action scene from the episode, this specific scene has nothing to do with nutrition, and it seems that the main message was not retained or expressed by his drawing (or its explanation). On the other hand, both his choices pre and post exposure rated the highest (**3/3** healthier options). He also expressed healthy choices for his breakfast preferences ("*egg… and… Mozzarella*"). His parents confirmed his liking for the choices he mentioned, but claimed that in the morning before school he usually have a more sweet breakfast, were to school (kindergarten) he gets the healthier choice. The child was able to distinguish correctly between good and bad characters of the series, and explained his food choice for Theo (the good guy), tuna and avocado, by claiming "*Avocado is healthy*. and tuna? *also healthy*". To the Boss (the bad) he gave Bamba (less healthy) and Apple, but he was not able to explain why. The result of his BMI indicates he is within the healthy range for his age.

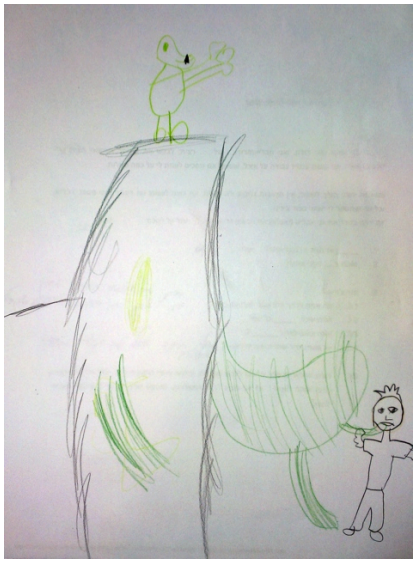


Child #2, boy, 10^{yrs} (4th grade). Portrayed through his drawing that the nutritional message was noticed and retained. He drew the Sugar Kingdom as 1.the kids that are hypnotized from the sugar see it and 2. as it is for real. He even explicitly wrote on each side of the page "*Real*" and "*Fake*" and mentioned that the candies are actually made from "*disgusting ingredients*". Pre exposure he chose **2/3** healthier choices. The child claimed he does not always eat breakfast before school

and if he does it is usually something for the road that can be considered less healthy (sweet biscuits and salty sunflower seeds). Both options are either high with sugar or salt. To school he takes healthier breakfast which includes a sandwich with Hummus spread and red pepper; tuna and cucumber or "*in rare occasions*" with chocolate spread. The result of his BMI indicates he is within the healthy range for his age.

Child #3 and **child #9**, both boys, 5 and 6^{yrs} (respectively) had initially expressed agreement to participate, but as the researcher arrived to the interview they chose not to participate (the first was upset at the time and the later was too deep into a iPhone game and was not willing to leave it). Those participants have been therefore ignored in our analysis.

Child #4, girl, 7^{yrs} (1st grade). This child was the only one in our sample that was familiar with the series prior to the experiment. She expressed enthusiasm immediately as the episode started, and said she know it. She was therefore asked if she still want to watch it prior to the 19th minute intervention– which she responded positively. When she was offered again to stop at 19 min, she stopped; claiming she is now watching all the episodes over again anyway, and she thinks the second season is broadcasted (she identified correctly the channel which broadcast the series). She knew to say that the episode is about "*it is forbidden to have to many candies*", but when explaining her drawing, she said: "*Ben eats... to the ones that don't eat it, it looks like garbage, but to the rest it looks like candies. It seems to them like he eats garbage, but it is actually candies*". It is therefore not clear whether she was able to identify correctly the purpose of the use of "hypnosis".



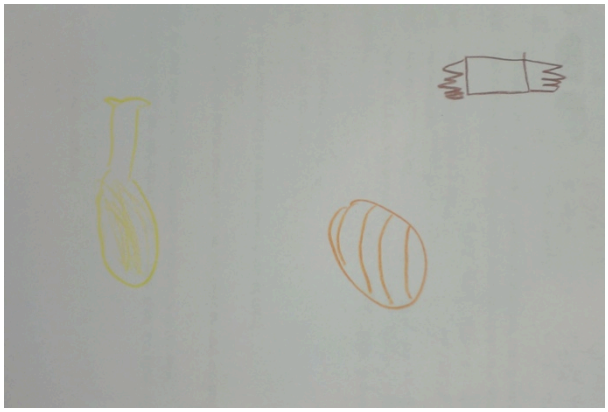
When comparing her food choices prior and post exposure, we could see she initially chose **1/3** healthier choice versus **2/3** healthier post exposure. She was also expressed healthier food choice to the "good guys", while less healthy to the bad ones.

In terms of breakfast habits, she expressed relative healthier choices than the rest, having Corn Flakes with milk or sometimes-chocolate milk and (always) Actimel before leaving for school. At school she usually have what her parents prepare for her, which is a sandwich with cheese or some kind of pastrami with addition to a fruit and

vegetable. According to her BMI, she was found **underweight**.

As she was the only child found with prior familiarity with the series, it is hard to conclude the reasons for the possible confusion in her explanation through the drawing.

Child #5, boy, 7^{yrs} (2nd grade). When was asked to draw what he remembered from the episode, he immediately said out loud: "*I remember sugar*". His painting was comprised of three items, which he explained to be "Candy, Orange and Potion". He was correctly describing: "*The orange helped Lena from the cold, the potion helped them to see everything disgusting, and the toffee is when they where hypnotized*". This clearly indicated that he was able to identify and retain the main issues mentioned in the episode.

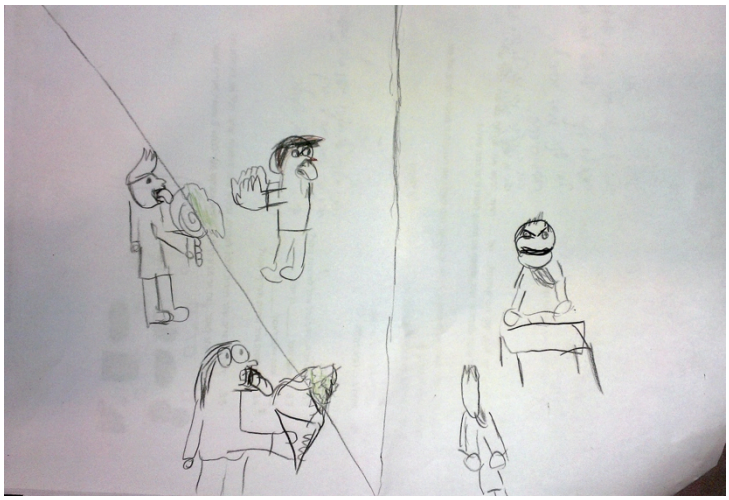


In terms of breakfast habits, once again, it seems that at home, the first breakfast can be described as less healthy, high with sugar - "*Ma'a'da'nim (from the prepared sweet pudding category) and one chocolate ball if there is*". His father confirmed that when he does have breakfast at home it is usually sweet, but some time he has nothing at all. At school on the other hand, once again, we can see that he takes healthier food, comprised from a sandwich with a vegetable. He claimed to have also a fruit (which was not mentioned by his father).

Interestingly, the child is considered overweight according to his BMI score, and while we can see his food habits for breakfast are not very healthy, in terms of food choices made both prior and post exposure, he scored **3/3** from the healthier options.

Child #6, girl, 10^{yrs} (4th grade) showed some suspicion before participating in the interview. She agreed to participate only after her father tried to convince her that it would help their friend very much. The interviewer addressed a couple of doubts she had regarding the interview and further stressed that she is not obliged and can stop at any time. The interviewer also made it clear for her that nothing wrong would happen if she will not participate, saying he things she would enjoy it – but it is really not mandatory and he can handle if she doesn't want. She eventually agreed to participate – but with her, special attention was given to stress the secrecy and that there are no right and wrong answers – it is her thoughts that interest us.

In her drawing she split the page first to two parts and than the left part into two (diagonally). The left side demonstrates clearly that she understood and retained the nutritional issue of the episode, as the diagonal line was separating from "*the way kids see it*" and the "*way it really is*". She painted all the kids with a tongue out, while for the hypnotized ones (Theo and Lena) it served for leaking the candy and the ice cream, to Sid it served to show disgust. Sid was looking backwards and was painted with large hands pulled to the front – demonstrating *stop!*.

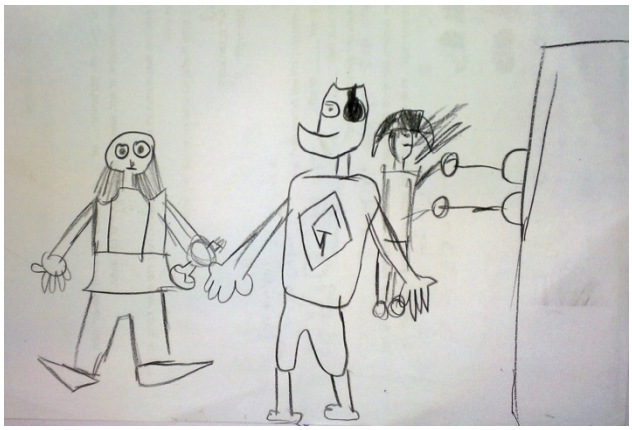


Both pre and post exposure she chose **2/3** healthy choices and her BMI indicated she is within the **healthy** range. She seemed to struggle to answer "*correct* " answers rather than her true choice and therefore was reminded that we look for "what you think" and that there are no "right answers". Example for that can be demonstrated through her reaction to the second food choice: "*Want?! Are you sure?*" ... "*I'm a child that knows how to abstain my self so it is not good you ask me... and not eat too many sweets*"… "*I'm a child that don't really like fruits and vegetables.*" She ended by saying that her parents are concerned with her eating well, and it is ok to eat sweets "*but all in proportion*".

In terms of her breakfast habits, at home she usually consume from the sweet prepared pudding category (high in sugar). For school she takes a sandwich with either avocado or chocolate spread. She claimed to reach an agreement that on Tue and Fri she gets the chocolate one. She remembered to say she also takes a fruit or a vegetable with her to school, but while her father confirmed this claim, he added that she usually don't it eat it "*unless she is really hungry*".

She claimed to enjoy watching the series and that she is interested in watching it again in the future, but when was asked if it is cool topic for conversation at school she said no. She said that it **might** be cool to speak about it with her younger brother but not with friends at school.

Child #7, boy, 10^{yrs} (4^{th} grade). From his painting we can see that he understood the purpose of the episode. He drew three characters: Sid, which he related as "*the prince with the bottle*", G-Squad Soldier that he related as "*the trolls of the bad guy*" and last, Lena, which he related as "*the girl that climb with the Pompot [slang for suction cups]*". While some of his drawing relates to the action part of the episode, he clearly understood the nutritional issue. When he described his painting he said: "*The prince explained to the group what candies can do for them and saves them from the world [e.g.: Sugar kingdom]*".



In terms of his nutritional habits, he claimed to mainly eat cereals or yogurt with granola and honey in the morning the cereals described, were mainly from the sweet types. He further mentioned that when he eats Corn Flakes (less sweet) he sweetens it with honey but would preferred having it sweeten from the factory. To school he takes a sandwich with usually healthier choice. He mentioned taking fruits and vegetables and his mother added that on longer days she sends him Quinoa salad. Interestingly, the choice of food mentioned both by the child and the mother, was done in the beginning of the semester. They sit and create an agreed list of food that she can choose from and would satisfy both of them. He mentioned getting sometimes also a sandwich with chocolate spread as well.

His food choice pre and post exposure has showed an improvement, scoring **2/3** healthier choices pre-exposure and **3/3** post exposure. His initial food choice pre exposure was actually scoring 3/3, but it seemed like he was choosing trying to satisfy the researcher, and when he was asked if that is the case and reminded that his opinion is what we look for, he changed his choice (from: Tuna, Avocado and Apple → Tuna, Chocolate cake and Apple). "*Because I know breakfast is the most important meal of the day and it is important to have good stuff on it*".

The researcher asked him to make a food choice for Ben instead of Theo (the main character) representing the good guy as he categorized Theo under the bad guys: "*he committed a crime*". His food choice for Ben was **3/3** healthier choices: "*as it shows in the movie that he likes sweets but we need to teach him to eat healthy*". To the bad guy

he chose the same "*as he should eat healthy and not sweet*".

His BMI is considered as being in the health range.

Child #8, boy, 7.5^{yrs} (1st grade). The last child seemed less interested in the drawing, and the researcher was ambiguous about his interest in the series at all. On the one hand, throughout the episode he seemed to be engaged with the video, making remarks out loud and jumping with the rhythm, on the other hand even though he claimed to enjoy, he rejected the offer to receive few episodes for future watching and wanted to stop in the 19th minute intervention, saying: "*No need. Lets finish helping you with your homework*".

Instead of drawing he wrote: "fu and fichss" (a way of showing disguised) on top of the page. He also drew simplistic drawing of four people, which he claimed to be few of the characters. He explained his drawing by saying: "*I have really short memory*." When the researcher tried to ask him what else he remember he said that the movie was trying to show something disgusting, the sugar kingdom.

In terms of his food choices pre and post exposure, both were scoring the healthiest choices (**3/3**). In terms of his eating habits, like most children in the research, he either eats sweet in the morning, or does not eat anything at home before going to school. The child claimed to have Pita Bread with cheese and vegetables (cucumber, red pepper or Tomato) to school. While his father description of what they send with him to school, matched with the child's claiming, but his father said they are not sure what he actually eats as he is very independent, and he might have breakfast in the Kibutz's dining room before heading off to school. Further, they often see that he brings back left over food that does not match what they have prepared in the morning, and they assume he trades food with his friends at school.